

$\chi_{b2}(2P)$

$I^G(JPC) = 0^+(2^{++})$
J needs confirmation.

Observed in radiative decay of the $\Upsilon(3S)$, therefore $C = +$. Branching ratio requires E1 transition, M1 is strongly disfavored, therefore $P = +$.

$\chi_{b2}(2P)$ MASS

VALUE (MeV)	DOCUMENT ID	COMMENT		
102686.5 ± 0.22 ± 0.50 OUR EVALUATION	From γ energy below, using $\Upsilon(3S)$ mass = 10355.2 ± 0.5 MeV [10.26865 ± 0.00022 ± 0.00050 GeV OUR 2012 EVALUATION]			

$m_{\chi_{b2}(2P)} - m_{\chi_{b1}(2P)}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
13.5 ± 0.4 ± 0.5	¹ HEINTZ	92 CSB2	$e^+ e^- \rightarrow \gamma X, \ell^+ \ell^- \gamma \gamma$

¹ From the average photon energy for inclusive and exclusive events. Supersedes NARAIN 91.

γ ENERGY IN $\Upsilon(3S)$ DECAY

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
86.19 ± 0.22 OUR EVALUATION	Treating systematic errors as correlated			
86.40 ± 0.18 OUR AVERAGE				
86.04 ± 0.06 ± 0.27		ARTUSO	05 CLEO	$\Upsilon(3S) \rightarrow \gamma X$
86 ± 1	101	CRAWFORD	92B CLE2	$e^+ e^- \rightarrow \ell^+ \ell^- \gamma \gamma$
86.7 ± 0.4	10319	² HEINTZ	92 CSB2	$e^+ e^- \rightarrow \gamma X$
86.9 ± 0.4	157	³ HEINTZ	92 CSB2	$e^+ e^- \rightarrow \ell^+ \ell^- \gamma \gamma$
86.4 ± 0.1 ± 0.4	30741	MORRISON	91 CLE2	$e^+ e^- \rightarrow \gamma X$
2 A systematic uncertainty on the energy scale of 0.9% not included. Supersedes NARAIN 91.				
3 A systematic uncertainty on the energy scale of 0.9% not included. Supersedes HEINTZ 91.				

$\chi_{b2}(2P)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
$\Gamma_1 \omega \Upsilon(1S)$	(1.10 $^{+0.34}_{-0.30}$) %	
$\Gamma_2 \gamma \Upsilon(2S)$	(10.6 ± 2.6) %	S=2.0
$\Gamma_3 \gamma \Upsilon(1S)$	(7.0 ± 0.7) %	
$\Gamma_4 \pi\pi\chi_{b2}(1P)$	(5.1 ± 0.9) $\times 10^{-3}$	
$\Gamma_5 D^0 X$	< 2.4 %	CL=90%
$\Gamma_6 \pi^+\pi^- K^+ K^- \pi^0$	< 1.1 $\times 10^{-4}$	CL=90%
$\Gamma_7 2\pi^+\pi^- K^- K_S^0$	< 9 $\times 10^{-5}$	CL=90%
$\Gamma_8 2\pi^+\pi^- K^- K_S^0 2\pi^0$	< 7 $\times 10^{-4}$	CL=90%
$\Gamma_9 2\pi^+ 2\pi^- 2\pi^0$	(3.9 ± 1.6) $\times 10^{-4}$	
$\Gamma_{10} 2\pi^+ 2\pi^- K^+ K^-$	(9 ± 4) $\times 10^{-5}$	
$\Gamma_{11} 2\pi^+ 2\pi^- K^+ K^- \pi^0$	(2.4 ± 1.1) $\times 10^{-4}$	
$\Gamma_{12} 2\pi^+ 2\pi^- K^+ K^- 2\pi^0$	(4.7 ± 2.3) $\times 10^{-4}$	
$\Gamma_{13} 3\pi^+ 2\pi^- K^- K_S^0 \pi^0$	< 4 $\times 10^{-4}$	CL=90%
$\Gamma_{14} 3\pi^+ 3\pi^-$	(9 ± 4) $\times 10^{-5}$	
$\Gamma_{15} 3\pi^+ 3\pi^- 2\pi^0$	(1.2 ± 0.4) $\times 10^{-3}$	
$\Gamma_{16} 3\pi^+ 3\pi^- K^+ K^-$	(1.4 ± 0.7) $\times 10^{-4}$	
$\Gamma_{17} 3\pi^+ 3\pi^- K^+ K^- \pi^0$	(4.2 ± 1.7) $\times 10^{-4}$	
$\Gamma_{18} 4\pi^+ 4\pi^-$	(9 ± 5) $\times 10^{-5}$	
$\Gamma_{19} 4\pi^+ 4\pi^- 2\pi^0$	(1.3 ± 0.5) $\times 10^{-3}$	

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$\chi_{b2}(2P)$ BRANCHING RATIOS

$\Gamma(\omega \Upsilon(1S))/\Gamma_{\text{total}}$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_1/Γ
$1.10^{+0.32+0.11}_{-0.28-0.10}$	$20.1^{+5.8}_{-5.1}$ 4	CRONIN-HEN..04	CLE3	$\Upsilon(3S) \rightarrow \gamma \omega \Upsilon(1S)$	

⁴ Using $B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) = (11.4 \pm 0.8)\%$ and $B(\Upsilon(1S) \rightarrow \ell^+ \ell^-) = 2 B(\Upsilon(1S) \rightarrow \mu^+ \mu^-) = 2 (2.48 \pm 0.06)\%$.

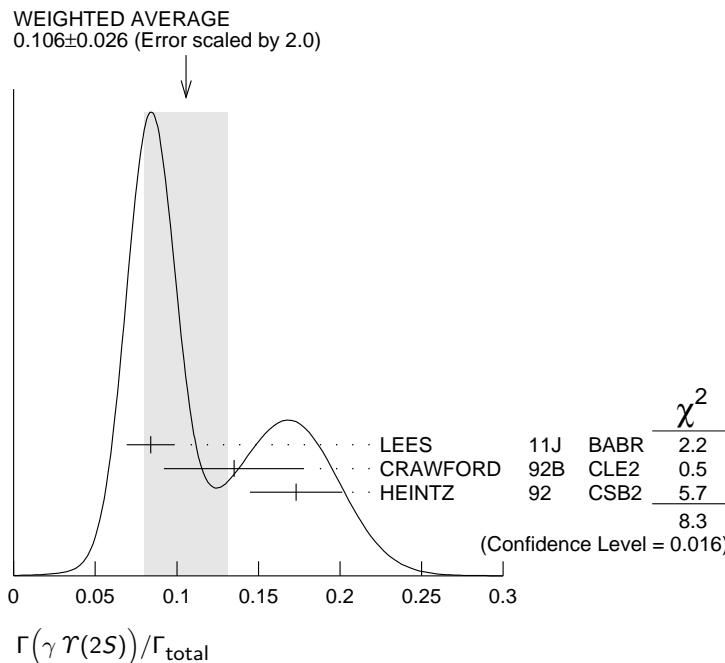
$\Gamma(\gamma \Upsilon(2S))/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_2/Γ
0.106 ± 0.026 OUR AVERAGE				Error includes scale factor of 2.0. See the ideogram below.	
$0.084 \pm 0.011 \pm 0.010$	2.5k	5 LEES	11J BABR	$\Upsilon(3S) \rightarrow X\gamma$	
$0.135 \pm 0.025 \pm 0.035$		6 CRAWFORD	92B CLE2	$e^+ e^- \rightarrow \ell^+ \ell^- \gamma\gamma$	
$0.173 \pm 0.021 \pm 0.019$		7 HEINTZ	92 CSB2	$e^+ e^- \rightarrow \ell^+ \ell^- \gamma\gamma$	

⁵ LEES 11J reports $[\Gamma(\chi_{b2}(2P) \rightarrow \gamma \Upsilon(2S))/\Gamma_{\text{total}}] \times [B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P))] = (1.1 \pm 0.1 \pm 0.1) \times 10^{-2}$ which we divide by our best value $B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

⁶ Using $B(\Upsilon(2S) \rightarrow \mu^+ \mu^-) = (1.37 \pm 0.26)\%$, $B(\Upsilon(3S) \rightarrow \gamma \gamma \Upsilon(2S)) \times 2 B(\Upsilon(2S) \rightarrow \mu^+ \mu^-) = (4.98 \pm 0.94 \pm 0.62) \times 10^{-4}$, and $B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) = 0.135 \pm 0.003 \pm 0.017$.

⁷ Using $B(\Upsilon(2S) \rightarrow \mu^+ \mu^-) = (1.44 \pm 0.10)\%$, $B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) = (11.1 \pm 0.5 \pm 0.4)\%$ and assuming $e\mu$ universality. Supersedes HEINTZ 91.



$\Gamma(\gamma \Upsilon(1S))/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_3/Γ
0.070 ± 0.007 OUR AVERAGE					
$0.070 \pm 0.004 \pm 0.008$	11k	8 LEES	11J BABR	$\Upsilon(3S) \rightarrow X\gamma$	
$0.072 \pm 0.014 \pm 0.013$		9 CRAWFORD	92B CLE2	$e^+ e^- \rightarrow \ell^+ \ell^- \gamma\gamma$	
$0.070 \pm 0.010 \pm 0.006$		10 HEINTZ	92 CSB2	$e^+ e^- \rightarrow \ell^+ \ell^- \gamma\gamma$	

⁸ LEES 11J reports $[\Gamma(\chi_{b2}(2P) \rightarrow \gamma \Upsilon(1S))/\Gamma_{\text{total}}] \times [B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P))] = (9.2 \pm 0.3 \pm 0.4) \times 10^{-3}$ which we divide by our best value $B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

⁹ Using $B(\Upsilon(1S) \rightarrow \mu^+ \mu^-) = (2.57 \pm 0.07)\%$, $B(\Upsilon(3S) \rightarrow \gamma \gamma \Upsilon(2S)) \times 2 B(\Upsilon(1S) \rightarrow \mu^+ \mu^-) = (5.03 \pm 0.94 \pm 0.63) \times 10^{-4}$, and $B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) = 0.135 \pm 0.003 \pm 0.017$.

¹⁰ Using $B(\Upsilon(1S) \rightarrow \mu^+ \mu^-) = (2.57 \pm 0.07)\%$, $B(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) = (11.1 \pm 0.5 \pm 0.4)\%$ and assuming $e\mu$ universality. Supersedes HEINTZ 91.

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NODE=M081R1;LINKAGE=B

NODE=M081R1;LINKAGE=C

$\Gamma(\pi\pi\chi_{b2}(1P))/\Gamma_{\text{total}}$					Γ_4/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
5.1±0.9 OUR AVERAGE					
4.9±0.7±0.6	17k	11 LEES	11C BABR	$e^+ e^- \rightarrow \pi^+ \pi^- X$	NODE=M081R4
6.0±1.6±1.4		12 CAWLFIELD	06 CLE3	$\gamma(3S) \rightarrow 2(\gamma\pi\ell)$	NODE=M081R4
11 ($0.64 \pm 0.05 \pm 0.08$) $\times 10^{-3}$.	We derive the value assuming $B(\gamma(3S) \rightarrow \chi_{b2}(2P)X) = B(\gamma(3S) \rightarrow \chi_{b2}(2P)\gamma) = (13.1 \pm 1.6) \times 10^{-2}$.				NODE=M081R4;LINKAGE=LE
12 CAWLFIELD 06 quote $\Gamma(\chi_b(2P) \rightarrow \pi\pi\chi_b(1P)) = 0.83 \pm 0.22 \pm 0.08 \pm 0.19$ keV assuming l-spin conservation, no D-wave contribution, $\Gamma(\chi_{b1}(2P)) = 96 \pm 16$ keV, and $\Gamma(\chi_{b2}(2P)) = 138 \pm 19$ keV.					NODE=M081R4;LINKAGE=CA
$\Gamma(D^0 X)/\Gamma_{\text{total}}$					Γ_5/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<2.4 × 10⁻²	90	13,14 BRIERE	08 CLEO	$\gamma(3S) \rightarrow \gamma D^0 X$	NODE=M081R01
13 For $p_{D^0} > 2.5$ GeV/c.					NODE=M081R01
14 The authors also present their result as $(0.2 \pm 1.4 \pm 0.1) \times 10^{-2}$.					NODE=M081R01;LINKAGE=BR
					NODE=M081R01;LINKAGE=RI
$\Gamma(\pi^+\pi^-K^+K^-\pi^0)/\Gamma_{\text{total}}$					Γ_6/Γ
VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT	
<1.1	90	15 ASNER	08A CLEO	$\gamma(3S) \rightarrow \gamma\pi^+\pi^-K^+K^-\pi^0$	NODE=M081R02
15 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow \pi^+\pi^-K^+K^-\pi^0)/\Gamma_{\text{total}}] \times [B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P))] < 14 \times 10^{-6}$ which we divide by our best value $B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P)) = 13.1 \times 10^{-2}$.					NODE=M081R02;LINKAGE=AS
$\Gamma(2\pi^+\pi^-K^-K_S^0)/\Gamma_{\text{total}}$					Γ_7/Γ
VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT	
<0.9	90	16 ASNER	08A CLEO	$\gamma(3S) \rightarrow \gamma 2\pi^+\pi^-K^-K_S^0$	NODE=M081R03
16 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 2\pi^+\pi^-K^-K_S^0)/\Gamma_{\text{total}}] \times [B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P))] < 12 \times 10^{-6}$ which we divide by our best value $B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P)) = 13.1 \times 10^{-2}$.					NODE=M081R03
$\Gamma(2\pi^+\pi^-K^-K_S^0 2\pi^0)/\Gamma_{\text{total}}$					Γ_8/Γ
VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT	
<7	90	17 ASNER	08A CLEO	$\gamma(3S) \rightarrow \gamma 2\pi^+\pi^-K^-2\pi^0$	NODE=M081R04
17 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 2\pi^+\pi^-K^-K_S^0 2\pi^0)/\Gamma_{\text{total}}] \times [B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P))] < 87 \times 10^{-6}$ which we divide by our best value $B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P)) = 13.1 \times 10^{-2}$.					NODE=M081R04;LINKAGE=AS
$\Gamma(2\pi^+2\pi^-2\pi^0)/\Gamma_{\text{total}}$					Γ_9/Γ
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT	
3.9±1.6±0.5	23	18 ASNER	08A CLEO	$\gamma(3S) \rightarrow \gamma 2\pi^+2\pi^-2\pi^0$	NODE=M081R05
18 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 2\pi^+2\pi^-2\pi^0)/\Gamma_{\text{total}}] \times [B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P))] = (51 \pm 16 \pm 13) \times 10^{-6}$ which we divide by our best value $B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					NODE=M081R05;LINKAGE=AS
$\Gamma(2\pi^+2\pi^-K^+K^-)/\Gamma_{\text{total}}$					Γ_{10}/Γ
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT	
0.9±0.4±0.1	11	19 ASNER	08A CLEO	$\gamma(3S) \rightarrow \gamma 2\pi^+2\pi^-K^+K^-$	NODE=M081R06
19 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 2\pi^+2\pi^-K^+K^-)/\Gamma_{\text{total}}] \times [B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P))] = (12 \pm 4 \pm 3) \times 10^{-6}$ which we divide by our best value $B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					NODE=M081R06;LINKAGE=AS
$\Gamma(2\pi^+2\pi^-K^+K^-\pi^0)/\Gamma_{\text{total}}$					Γ_{11}/Γ
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT	
2.4±1.0±0.3	16	20 ASNER	08A CLEO	$\gamma(3S) \rightarrow \gamma 2\pi^+2\pi^-K^+K^-\pi^0$	NODE=M081R07
20 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 2\pi^+2\pi^-K^+K^-\pi^0)/\Gamma_{\text{total}}] \times [B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P))] = (32 \pm 11 \pm 8) \times 10^{-6}$ which we divide by our best value $B(\gamma(3S) \rightarrow \gamma\chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					NODE=M081R07;LINKAGE=AS

$\Gamma(2\pi^+ 2\pi^- K^+ K^- 2\pi^0)/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
4.7±2.2±0.6	14	21 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 2\pi^+ 2\pi^- K^+ K^- 2\pi^0$
21 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 2\pi^+ 2\pi^- K^+ K^- 2\pi^0)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] = (62 \pm 23 \pm 17) \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

 $\Gamma(3\pi^+ 2\pi^- K^- K_S^0 \pi^0)/\Gamma_{\text{total}}$ Γ_{13}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<4	90	22 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 3\pi^+ 2\pi^- K^- K_S^0 \pi^0$
22 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 3\pi^+ 2\pi^- K^- K_S^0 \pi^0)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] < 58 \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = 13.1 \times 10^{-2}$.				

 $\Gamma(3\pi^+ 3\pi^-)/\Gamma_{\text{total}}$ Γ_{14}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
0.9±0.4±0.1	14	23 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 3\pi^+ 3\pi^-$
23 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 3\pi^+ 3\pi^-)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] = (12 \pm 4 \pm 3) \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

 $\Gamma(3\pi^+ 3\pi^- 2\pi^0)/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
12±4±1	45	24 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 3\pi^+ 3\pi^- 2\pi^0$
24 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 3\pi^+ 3\pi^- 2\pi^0)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] = (159 \pm 33 \pm 43) \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

 $\Gamma(3\pi^+ 3\pi^- K^+ K^-)/\Gamma_{\text{total}}$ Γ_{16}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.4±0.7±0.2	12	25 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 3\pi^+ 3\pi^- K^+ K^-$
25 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 3\pi^+ 3\pi^- K^+ K^-)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] = (19 \pm 7 \pm 5) \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

 $\Gamma(3\pi^+ 3\pi^- K^+ K^- \pi^0)/\Gamma_{\text{total}}$ Γ_{17}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
4.2±1.7±0.5	16	26 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 3\pi^+ 3\pi^- K^+ K^- \pi^0$
26 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 3\pi^+ 3\pi^- K^+ K^- \pi^0)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] = (55 \pm 16 \pm 15) \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

 $\Gamma(4\pi^+ 4\pi^-)/\Gamma_{\text{total}}$ Γ_{18}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
0.9±0.4±0.1	9	27 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 4\pi^+ 4\pi^-$
27 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 4\pi^+ 4\pi^-)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] = (12 \pm 5 \pm 3) \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

 $\Gamma(4\pi^+ 4\pi^- 2\pi^0)/\Gamma_{\text{total}}$ Γ_{19}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
13±5±2	27	28 ASNER	08A CLEO	$\Gamma(3S) \rightarrow \gamma 4\pi^+ 4\pi^- 2\pi^0$
28 ASNER 08A reports $[\Gamma(\chi_{b2}(2P) \rightarrow 4\pi^+ 4\pi^- 2\pi^0)/\Gamma_{\text{total}}] \times [B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P))] = (165 \pm 46 \pm 50) \times 10^{-6}$ which we divide by our best value $B(\Gamma(3S) \rightarrow \gamma \chi_{b2}(2P)) = (13.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

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$\chi_{b2}(2P)$ Cross-Particle Branching Ratios

$$\Gamma(\chi_{b2}(2P) \rightarrow \gamma \Upsilon(1S)) / \Gamma_{\text{total}} \times \Gamma(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) / \Gamma_{\text{total}}$$

$$\Gamma_3 / \Gamma \times \Gamma_{19}^{\Upsilon(3S)} / \Gamma^{\Upsilon(3S)}$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$9.2 \pm 0.3 \pm 0.4$	11k	LEES	11J	BABR $\Upsilon(3S) \rightarrow X \gamma$

$$\Gamma(\chi_{b2}(2P) \rightarrow \gamma \Upsilon(2S)) / \Gamma_{\text{total}} \times \Gamma(\Upsilon(3S) \rightarrow \gamma \chi_{b2}(2P)) / \Gamma_{\text{total}}$$

$$\Gamma_2 / \Gamma \times \Gamma_{19}^{\Upsilon(3S)} / \Gamma^{\Upsilon(3S)}$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.1 \pm 0.1 \pm 0.1$	2.5k	LEES	11J	BABR $\Upsilon(3S) \rightarrow X \gamma$

$$B(\chi_{b2}(2P) \rightarrow \chi_{b2}(1P) \pi^+ \pi^-) \times B(\Upsilon(3S) \rightarrow \chi_{b2}(2P) X)$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.64 \pm 0.05 \pm 0.08$	17k	LEES	11C	BABR $e^+ e^- \rightarrow \pi^+ \pi^- X$

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NODE=M081B01

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NODE=M081B02

NODE=M081R16

NODE=M081R16

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REFID=49766

REFID=43177

REFID=43177

REFID=43604

REFID=41580

REFID=41634

REFID=41586

 $\chi_{b2}(2P)$ REFERENCES

LEES	11C	PR D84 011104	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	11J	PR D84 072002	J.P. Lees <i>et al.</i>	(BABAR Collab.)
ASNER	08A	PR D78 091103	D.M. Asner <i>et al.</i>	(CLEO Collab.)
BRIERE	08	PR D78 092007	R.A. Briere <i>et al.</i>	(CLEO Collab.)
CAWLFIELD	06	PR D73 012003	C. Cawfield <i>et al.</i>	(CLEO Collab.)
ARTUSO	05	PRL 94 032001	M. Artuso <i>et al.</i>	(CLEO Collab.)
CRONIN-HEN... 04		PRL 92 222002	D. Cronin-Hennessy <i>et al.</i>	(CLEO Collab.)
CRAWFORD	92B	PL B294 139	G. Crawford, R. Fulton	(CLEO Collab.)
HEINTZ	92	PR D46 1928	U. Heintz <i>et al.</i>	(CUSB II Collab.)
HEINTZ	91	PRL 66 1563	U. Heintz <i>et al.</i>	(CUSB Collab.)
MORRISON	91	PRL 67 1696	R.J. Morrison <i>et al.</i>	(CLEO Collab.)
NARAIN	91	PRL 66 3113	M. Narain <i>et al.</i>	(CUSB Collab.)